

REMARKS

The Applicant has carefully reviewed the Office Action dated July 10, 2008 relating to the subject patent application. Based on the foregoing claim amendments and the following remarks, the Applicant submits that the pending claims are in condition for allowance. Reconsideration of the amended claims and issuance of a notice of allowance are respectfully requested.

Status of the Claims

Claims 1-34 were pending in this patent application. Claims 7-16 and 19-30 are withdrawn as non-elected claims in response to a restriction requirement under 35 U.S.C. 121 and 372. The Applicant elected to prosecute Claims 1-6, 17-18 and 31-34, and reserves the right to file divisional application(s) directed to the non-elected subject matter.

The Applicant has canceled Claims 2, 3 and 17, and amended Claims 1, 4-6, 18, 31 and 32. Support for the amendment to Claim 1 can be found in original Claims 2 and 3. Claims 4-6, 18, 31 and 32 are amended to place these claims in proper form for allowance. Thus, no new matter is added as a result of the claim amendments. Claims 1, 4-6, 18 and 31-34 are currently pending.

Claims 3-6, 17, 18, 31 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated. Claims 3-6, 17, 18, 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable.

Claimed Invention

The claimed invention of independent Claim 1 is related to a valve including a valve housing providing a chamber accommodating at least part of a valve member, the chamber forming at least part of a first or high pressure side of valve, a valve port leading from the chamber to a second or low-pressure side of the valve, a valve seat around the valve port, the valve member having a seating surface co-operating with the valve seat and the valve member being displaceable, along an axis passing through the port, respectively (a) in a first direction, to move the seating surface into the chamber and away from the valve seat and (b) in a second, opposite direction, to move the seating surface towards the valve seat, biasing means being provided biasing the valve member in the second direction towards its closed position, the valve

housing having an extension extending, in the second direction, beyond the port and forming a transverse wall at an axial end of the extension at a distance from the port, the extension having an axial bore extending from the port and forming a central aperture in the transverse wall, which aperture forms a bearing for an axial extension of the valve member through which bearing the axial extension passes as a sliding fit, whereby the valve member is guided for the axial movement, the axial bore being bored out to a seat diameter of the valve port up to a distance just short of the transverse wall to provide a passage for gas from the port and at least one transverse outlet bore radiating from the axial bore to a respective opening in a side wall of the extension, on the periphery of the valve housing, so that gas outflow from the port is translated from the axial sense to the radial sense, the transverse wall serving to deflect any gas proceeding from the valve port in a direction parallel with the valve axis, wherein the periphery of the extension of the valve housing is undercut in the region behind the transverse wall, in such a way that the undercut region becomes gradually increasingly spaced from the axis with distance, measured parallel with the axis, away from the transverse wall, so that over the undercut region, the peripheral surface of the valve body is inclined with respect to the axis, and wherein one or each of the opening or openings at the side of the valve body opens onto the inclined peripheral surface.

The claimed invention as recited in independent Claim 4 is related to a valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of said valve, a valve seat around the valve port, said valve member having a seating surface co-operating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, the valve member having a bore extending axially from the high pressure end thereof and forming a cylinder sealingly slidable, in said first and second directions, on a piston fixed within said valve housing, to define therewith a further chamber, biasing means being provided biasing said valve member in said second direction towards its closed position, said further chamber in either case communicating with the low pressure side of the valve, and wherein said piston has a base part or a supporting insert providing an outer periphery received in an internal recess or groove

provided around a bore which extends axially into the valve housing from a high pressure end thereof and which bore at least partially defines said chamber accommodating the valve member, said internal recess or groove being disposed at a location remote from said valve seat, the valve housing having one or more longitudinal slits therethrough extending from the high pressure end of the valve housing, (i.e. the end remote from said valve seat) adjacent said internal groove or recess and extending through the location of said internal groove or recess, the material of the valve housing being sufficiently resilient to allow the wall of the valve housing to be flexed outwardly sufficiently to allow said base part or insert to pass within said bore in the valve housing from said high pressure end thereof to the axial position of said internal groove or recess and to allow the wall of the valve housing thereafter to spring back around said base part or insert to locate said base part or insert in said internal groove or recess.

The claimed invention of independent Claim 5 is related to a valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of said valve, a valve seat around the valve port, said valve member having a seating surface co-operating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, the valve member having a bore extending axially from the high pressure end thereof and forming a cylinder sealingly slidable, in said first and second directions, on a piston fixed within said valve housing, to define therewith a further chamber, biasing means being provided biasing said valve member in said second direction towards its closed position, said further chamber in either case communicating with the low pressure side of the valve, and wherein said piston has a base part or supporting insert providing an outer periphery received in an internal recess or groove provided around a bore which extends axially into the valve housing from a high pressure end thereof and which bore at least partially defines said chamber accommodating the valve member, said internal recess or groove being disposed at a location remote from said valve seat, wherein the base part or supporting insert is designed for resilient inward flexing to allow it to be inserted in the bore in the valve housing from said high pressure end thereof to spring into said groove

when the base part or insert is at the longitudinal position of said internal groove or recess, thereby to retain said piston in place.

Election/Restriction Under 35 U.S.C. 121 and 372

As identified above, the Applicant has elected to prosecute the Group I claims drawn to a valve. Thus, the Group II claims drawn to a sealing arrangement, i.e., Claims 7-16 and 19-30, are withdrawn from further consideration as being drawn to non-elected subject matter. The Applicant affirms the election without traverse to prosecute the invention of Group I.

Objection to Drawings

The Examiner has objected to the drawings under 37 CFR 1.83(a) because the drawings must show every feature of the invention specified in the claims. In response to this objection, the Applicant has amended Claims 4 and 5 to delete the recitation of “the effective area of said valve member” and “the area encompassed by said valve seat”, in accordance with the Examiner’s suggestion. Thus, the Applicant submits that the objection by the Examiner should no longer stand.

Rejection of Claims 3-6, 17, 18, 31 and 32 under 35 U.S.C. 112, Second Paragraph

The Examiner rejects Claims 3 and 17 under 35 U.S.C. 112, second paragraph, as being indefinite because it is unclear whether the feature in the parentheses in lines 2-4 is part of the claim or not. The Applicant has canceled Claims 3 and 17 and therefore, this rejection is moot.

The Examiner rejects Claim 4 under 35 U.S.C. 112, second paragraph, as being indefinite because it is unclear whether the feature in the parentheses in lines 21-22 is part of the claim or not. The Applicant has amended Claim 4 to delete the parentheses from the claim and therefore, the Applicant submits that Claim 4 as amended is in compliance with 35 U.S.C. 112, second paragraph.

The Examiner further rejects Claim 4 under 35 U.S.C. 112, second paragraph, as being indefinite because the recitation of a feature in line 13 and a feature in line 15 lack sufficient antecedent basis. The Applicant submits that Claim 4 has been amended to delete these recited features. Furthermore, the Examiner rejects Claim 5 under 35 U.S.C. 112, second paragraph, as being indefinite because the recitation of a feature in line 13 and a feature in line 15 lack

sufficient antecedent basis. The Applicant submits that Claim 5 has been amended to delete these recited features. Thus, the Applicant submits that Claims 4 and 5 as amended are in compliance with 35 U.S.C. 112, second paragraph, and this rejection should not stand.

The Examiner rejects Claims 6 and 18 under 35 U.S.C. 112, second paragraph, as being indefinite because it is unclear whether the feature in the parentheses in line 2 is part of the claim or not. The Applicant has amended Claims 6 and 18 to delete the parentheses from the claims and therefore, the Applicant submits that Claims 6 and 18 as amended are in compliance with 35 U.S.C. 112, second paragraph.

The Examiner rejects Claims 31 and 32 under 35 U.S.C. 112, second paragraph, as being indefinite because it is unclear whether the feature in the parentheses in line 13 is part of the claim or not. The Applicant has amended Claims 31 and 32 to delete the parentheses from the claims and therefore, the Applicant submits that Claims 31 and 32 as amended are in compliance with 35 U.S.C. 112, second paragraph.

Rejection of Claims 1 and 2 Under 35 U.S.C. 102(b)

The Examiner rejects Claims 1 and 2 under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,911,220 to Morgan ("Morgan"). As above-identified, independent Claim 1 is amended and dependent Claim 2 is canceled. As amended, Claim 1 includes the features recited in original Claims 2 and 3. The Applicant submits that amended Claim 1 is distinguishable from the Morgan reference. There is nothing in Morgan to teach or suggest a valve wherein the periphery of the extension of the valve housing is undercut in the region behind the transverse wall, in such a way that the undercut region becomes gradually increasingly spaced from the axis with distance, measured parallel with the axis, away from the transverse wall, so that over the undercut region, the peripheral surface of the valve body is inclined with respect to the axis, and wherein the or each of the opening or openings at the side of the valve body opens onto the inclined peripheral surface. This distinction between the claimed invention and Morgan is acknowledged by the Examiner in paragraph 16, on page 11 of the Office Action. Thus, the Applicant submits that independent Claim 1 is distinguishable from Morgan and therefore, the claimed invention of Claim 1 overcomes this rejection under 35 U.S.C. 102(b).patentable over Morgan.

The Applicant submits that dependent Claim 2 has been canceled and therefore, this rejection is moot with respect to Claim 2.

Rejection of Claims 4-6 and 18 Under 35 U.S.C. 103(a)

The Examiner rejects Claims 4-6 and 18 under 35 U.S.C. 103(a) as being unpatentable over Morgan. The Applicant respectfully traverses this rejection.

In regards to independent Claims 4 and 5, the Applicant submits that in Morgan, movable valve member 118 has a central opening 124 (e.g., bore) which one of ordinary skill in the art may assume to be cylindrical in shape. There is nothing in Morgan to teach or suggest opening/bore 124 being located “on” a piston (or even “near” a piston), as recited in Claims 4 and 5 of the claimed invention. As shown in Figure 1 of Morgan, one end of a pin 143 is received within the central opening 124 of the movable valve member 118 and, the other end of the pin 143 is received within a pin support 144. The pin 143 extends upwardly from valve member 118 and, the pin 144 engages the underside of diaphragm 152. The pin support 144 is not “fixed” within the rotatable valve body 22, as recited in Claim 4 of the claimed invention, but is instead movable within the rotatable valve body 22 with the diaphragm 152. Furthermore, the Applicant submits that as shown in Figure 1 of Morgan, the valve cavity 84 is positioned on the underside of diaphragm 152 and located between the diaphragm 152 and the main body portion 78. Thus, the rotatable valve member 50 is not a base part of the pin support 144, as recited in the claimed invention.

For these reasons, the Applicant submits that Claims 4 and 5 are patentable over the Morgan reference.

In regards to dependent Claims 6 and 18, the Applicant submits that since these claims depend from a patentable base claim (i.e., Claims 4 and 5, respectively), they are also patentable over the Morgan reference.

Rejection of Claims 3 and 17 Under 35 U.S.C. 103(a)

The Examiner rejects Claims 3 and 17 under 35 U.S.C. 103(a) as being unpatentable over Morgan in view of United States Patent No. 4,799,285 (Berfield). The Applicant submits that Claims 3 and 17 have been canceled and therefore, this rejection is moot.

Rejection of Claims 31-34 Under 35 U.S.C. 103(a)

The Examiner rejects Claims 31-34 under 35 U.S.C. 103(a) as being unpatentable over Morgan in view of United States Patent No. 5,452,883 to Holson ("Holson"). The Applicant respectfully traverses this rejection. Claims 31 and 33 depend from independent Claim 4 and Claims 32 and 34 depend from independent Claim 5. The Applicant submits that Claims 4 and 5 are patentable over Morgan for the reasons set forth above which are equally applicable in this context. Since Claims 31-34 depend from a patentable base claim (i.e., Claim 4 or Claim 5), they are also patentable over Morgan. Furthermore, the Applicant submits that Claims 31-34 are independently patentable over Morgan because, as acknowledged by the Examiner, Morgan does not disclose a sealing arrangement as recited in the claimed invention of Claims 31 and 32 (see paragraph 17 on page 13 of the Office Action) and Claims 33 and 34 (see paragraph 17 on page 16 of the Office Action). In Morgan, a sealing arrangement is disclosed only in the context of the cylindrical member 264 being sealed with respect to gas pressure flow by means of an O-ring 267 which seats the orifice or crown 266 in a position to prevent gas passage around the orifice, and O-ring 268 which seals the valve body 262 into the interior of the valve body 230.

With respect to Holson, the Applicant submits that the claimed invention of independent Claims 4 and 5 are patentable over Holson because there is nothing in this reference to teach or suggest a valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of said valve, a valve seat around the valve port, said valve member having a seating surface co-operating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, the valve member having a bore extending axially from the high pressure end thereof and forming a cylinder sealingly slidable, in said first and second directions, on a piston fixed within said valve housing, to define therewith a further chamber, biasing means being provided biasing said valve member in said second direction towards its closed position, said further chamber in either case communicating with the low pressure side of the valve, and wherein said piston has a base part or a supporting insert providing an outer periphery received in an internal recess or groove provided around a bore which extends axially into the valve

housing from a high pressure end thereof and which bore at least partially defines said chamber accommodating the valve member, said internal recess or groove being disposed at a location remote from said valve seat, the valve housing having one or more longitudinal slits therethrough extending from the high pressure end of the valve housing, (i.e. the end remote from said valve seat) adjacent said internal groove or recess and extending through the location of said internal groove or recess, the material of the valve housing being sufficiently resilient to allow the wall of the valve housing to be flexed outwardly sufficiently to allow said base part or insert to pass within said bore in the valve housing from said high pressure end thereof to the axial position of said internal groove or recess and to allow the wall of the valve housing thereafter to spring back around said base part or insert to locate said base part or insert in said internal groove or recess, as recited in independent Claims 4 and 5. The Applicant submits that since Claims 31-34 depend from a patentable base claim (Claim 4 or Claim 5), that they are also patentable over Holson.

When considering the combination of the Morgan and Holson references, the Applicant submits that there is nothing in Morgan to teach or suggest combining it with the teaching in Holson to obtain the claimed invention. Morgan merely discloses the use of O-rings as a sealing device for the cylindrical member and valve body. Thus, there would be no motivation for one of ordinary skill in the art to look to Holson to modify Morgan. Furthermore, even if such combination were proper (which the Applicant submits is improper), the Morgan and Holson references still do not fairly suggest the claimed invention of Claims 31-34 because neither reference teaches or suggests the periphery of the extension of the valve housing being undercut in the region behind the transverse wall, in such a way that the undercut region becomes gradually increasingly spaced from the axis with distance, measured parallel with the axis, away from the transverse wall, so that over the undercut region, the peripheral surface of the valve body is inclined with respect to the axis, and wherein the or each of the opening or openings at the side of the valve body opens onto the inclined peripheral surface.

Thus, the Applicant submits that Claims 31-34 overcome this rejection under 35 U.S.C. 103(a).

CONCLUSION

The Applicant submits that based on the reasoning set forth herein, the pending Claims 1, 4-6, 18 and 31-34 are patentable over the prior art of record as cited by the Examiner. Thus, the

Applicant respectfully requests reconsideration of the claims and the prompt issuance of a notice of allowance.

Respectfully submitted,

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